Name: Yahaya Salima Ochu

Department Nursing science

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Assignment

Defects of the eye

Answers

1. Myopia: (nearsightedness) This is a defect of vision in which far objects appear blurred but near objects are seen clearly. The image is focused in front of the retina rather than on it usually because the eyeball is too long or the refractive power of the eye’s lens too strong. Myopia can be corrected by wearing glasses/contacts with concave lenses these help to focus the image on the retina.

Myopia is often called nearsightedness, because people who have it can only see nearby objects in sharp focus. It is caused by too much curvature of the cornea relative to the length of the eyeball. This causes the light rays in the eye to be focused in front of the retina instead of on it.

laser correction, this curvature is reduced, moving the focal point of the light to the retina and enabling clear vision without corrective lenses.

2. Hyperopia: (farsightedness) This is a defect of vision in which there is difficulty with near vision but far objects can be seen easily. The image is focused behind the retina rather than upon it. This occurs when the eyeball is too short or the refractive power of the lens is too weak. Hyperopia can be corrected by wearing glasses/contacts that contain convex lenses.

Hyperopia, or farsightedness, is just the opposite – people with it can see clearly far away, but not close up. It is caused by insufficient curvature of the cornea relative to the length of the eyeball. This puts the focal point of the light rays behind the retina instead of on it.

laser correction, the curvature of the cornea is increased, moving the focal point of the light to the retina and enabling clear vision.

3. Astigmatism: This defect is when the light rays do not all come to a single focal point on the retina, instead some focus on the retina and some focus in front of or behind it. This is usually caused by a non-uniform curvature of the cornea. A typical symptom of astigmatism is if you are looking at a pattern of lines placed at various angles and the lines running in one direction appear sharp whilst those in other directions appear blurred. Astigmatism can usually be corrected by using a special spherical cylindrical lens; this is placed in the out-of-focus axis.

In astigmatism, the cornea is misshapen and does not properly focus the light entering the eye. Instead of hitting the retina in a focused point, the light is spread over two or more points. The result is a blurry or stretched image.

laser treatment, the cornea is brought into a shape that focuses the light on the retina correctly.

4. PRESBYOPIA

Presbyopia generally is believed to stem from a gradual thickening and loss of flexibility of the natural lens inside your eyePresbyopia usually occurs beginning at around age 40, when people experience blurred near vision when reading, sewing or working at the computer. Everyone becomes presbyopic

Presbyopia is an age-related condition that occurs as the lens loses its ability to change shape. This reduces the eye’s ability to adjust for different distances, especially close up, so that the weakly bundled light rays are not focused at the retina.

In “PresbyMAX” treatment with SCHWIND AMARIS, close-in clarity becomes easy again for people with aging eyes. The treatment can also alleviate other vision defects like nearsightedness, farsightedness or astigmatism.

5. Higher-order defects (aberrations)

Higher-order vision defects, often called aberrations, can take many different forms. Aberration is a synonym for error and refers to the fact that in higher-order defects the light rays are focused erroneously so that they don’t form a clear picture. 80% of aberrations are caused by corneal defects, and only 20% by issues with the lens or vitreous body. On most people these errors are so small that they don’t impair visual acuity. Higher-order defects become most noticeable at night and in twilight, when light reaches the retina with less focus. Under these conditions, vision can become much worse and/or the individual is more susceptible to glare.

These visual defects can often be corrected by laser surgery with wavefront-guided treatment. This requires that the aberrations be precisely localised. SCHWIND offers diagnostic systems that deliver extremely precise information on the cornea and the entire eye, enabling individually adapted treatment.